In hopes the experiment here recited may be taken in this view, as tending, in conjunction with a variety of others, to illuſtrate an important point, I beg leave to preſent it to your Lordſhip; and am

My Lord,

Your Lordſhip's

moſt obedient

and devoted

humble ſervant,

St. Helena,
July 30, 1761.

Nevil Maſkelyne.

LXVII. *Obſervations upon ſome Gems ſimilar to the Tourmalin; by Mr.* Benjamin Wilſon, *F. R. S.*

Read Jan. 28, 1762.

THE honour I received from the Royal Society, in conſequence of my late papers on electricity, and which principally reſpected the Tourmalin, is a pleaſing motive for embraceing the firſt opportunity to communicate farther enquiries, that tend to throw more light upon this curious ſubject.

In September laſt, I met with ſeveral gems of different ſizes and colours, that reſemble the Tourmalin, in regard to electric experiments. The moſt beautiful

of

of them are ſomething like the ruby, others are more pale, and there is one inclining to the orange colour. In point of hardneſs and luſtre, they are nearly the ſame with the topaz.

Six of theſe gems are cut brilliant faſhion, and three retain their natural ſhape. Of the ſix, when heated properly, and whilſt they are cooling, three are electrified *plus*, and two *minus*, at the table ſurface, and at the collet, or oppoſite ſurface, the three are electrified *minus*, and the two *plus*. The ſixth, which is the largeſt, and of an oblong ſhape, appears to be electrified *plus* near one end, and at the other end, in the oppoſite part, *minus*.

Theſe inſtances are farther proofs of the law obſerved in the Tourmalin, viz. that the electric fluid flows to or fro, *in one invariable line*, according to the circumſtances attending the experiment. See the Letter to Dr. Heberden, Philoſophical Tranſactions, Vol. LI.

From the contrary appearances happening with gems of the ſame ſhape, it is now abundantly evident, that the direction of the fluid does not depend upon the external figure of the gem, but upon ſome particular internal make or conſtitution thereof. And that there is ſome ſuch natural diſpoſition in all gems affording theſe appearances, may be collected from another curious ſpecimen of the Tourmalin kind; that is green, and formed in long ſlender cryſtals with ſeveral ſides, many of which are found ſticking together, and are brought from South America.

Mr. Emanuel Mendez da Coſta, member of this Society, and well known for his ſkill in natural hiſtory, furniſhed me with a parcel of theſe uncommon cryſtals the 12th of November laſt, and deſired I would try whether they afforded the electric effects of the Tourmalin. They were examined the ſame evening, when I was agreeably ſurprized to find them, not only like Tourmalins in regard to electric appearances, but that the direction of the electric fluid moving therein, *is always along the grain or ſhootings of the cryſtals*; one end thereof being electrified *plus*, and the other end *minus*. And that the fluid is more diſpoſed to paſs in that direction than in any other, may be further collected from what has been obſerved upon the grain of the loadſtone by Dr. Knight; for though the magnetic poles, of a natural loadſtone, may be varied in any direction, yet the ſame loadſtone does admit of being made much more magnetical along the grain, than acroſs it.

Now, as ſeveral of the above gems have different electric poles independent of their ſhape, and I have not yet been able to vary the direction of the fluid in any one of them, though various methods have been tried, and ſome of a violent nature; and ſince the green cryſtal, or chryſolite, above deſcribed, hath likewiſe the ſame electric poles, but with this difference only, that the fluid moves always along the ſlender threads or columns, which is the grain thereof, and without ſuffering any change from that direction; it ſeems by analogy, that the electric fluid flowing through all of them, moves in that direction in which the grain happens to lie. And the reaſon appears to be this, that the reſiſtance the fluid meets with in paſſing through the gem, is leſs in that direction, than in any other.

The

The natural hiſtory of theſe chryſolites, ſo far as Mr. Da Coſta has been able to collect it, is, " that " they were given him by the name of Brazilian " emeralds, that they are a kind of cryſtals ſhooting " into columns of no regular ſides or angles, but " canaliculated, or ſtriated lengthwiſe. That as they " are all fragments, he ſuſpects, they do not ſhoot " in vacuities of ſtones, or fiſſures of rocks, like " other cryſtals; but lie always cloſely imbedded in " the hard rocks (quartz) and are waſhed from their " ſaid beds by the torrents, in like manner as the " Brazil and Guinea gold is; which is the reaſon of " their being in ſuch fragments." He adds, " that " the cryſtals, black, analogous to theſe, and imbedded in quartz, or hard rocks, are found in our " mines in Cornwall, and in other parts of Europe; " ſpecimens of ſuch are in the Britiſh muſeum, and " in other cabinets. The Swedes call theſe bodies " lapides cornei cryſtalliſati, and Wallerius has a " corneus cryſtalliſatus viridis, which likely is this " kind. The miners of Germany vulgarly call them " Schirl, and ſometimes our Engliſh miners name " them Cockle and Call. The ranging of this cryſtal, " Mr. Da Coſta ſays, as a lapis corneus, is not only " erroneous, but ridiculous; as it is truly a kind of " cryſtal, and might with propriety be ſynonymed " Cryſtallus viridis columnaris lateribus inordinatis."

I ſhall conclude this paper with a paſſage in the Optics of Sir Iſaac Newton, which is one inſtance, among many of the wonderful ſagacity of that great man; as it correſponds very well with what we now underſtand of the electric fluid, which, by the continual motion of its parts, is ſo principally concerned in in the various operations of nature. It is in conſequence of ſuch a motion, ariſing from a certain degree of heat, that the Tourmalin, and the other gems, are rendered ſtrongly electric: and this plainly ſhews, that a leſs degree, even that which accompanies them where they are found, may make them alſo electric; but with the difference of making them leſs ſenſibly ſo. Accordingly, having explained what he means by the word attraction, he ſays, "The attraction of "gravity, magnetiſm, and electricity, reach to very "ſenſible diſtances, and ſo have been obſerved by "vulgar eyes; and there may be others which reach "to ſo ſmall diſtances as hitherto eſcape obſervation, "and perhaps electrical attraction may reach to ſuch "ſmall diſtances, *even without being excited by friction.*"

London,
December 23, 1761.

LXVIII. *Obſervations on the Tides in the Straits of* Gibraltar; *by* Henry More, *Eſq;*

Read Jan. 28, 1762.

AS every attempt made, whether attended with ſucceſs or not, towards illuſtrating what is already known, or drawing from obſcurity for want of ſufficient obſervation, or ſcouring off the ruſt of error from reality, either through curioſity or order, has always met with the candid countenance of your moſt honourable Society;